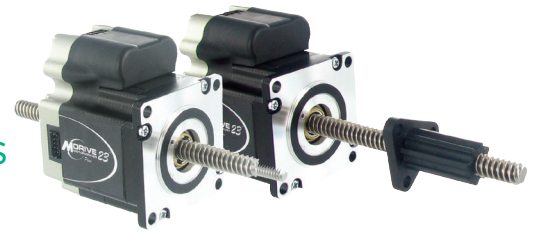


MDrive® Plus/Plus² MLI•23

NEMA 23 (54mm) Programmable Motion Control Linear Actuator with integrated 1.8° 2-phase stepper motor & control electronics

CE RoHS REACH IP20



PRODUCT OVERVIEW

MDrive Linear Actuators are compact linear motion systems. External or non-captive shaft linear mechanicals are integrated with stepper motor and electronics for reliable, repeatable motion. Customization is available for volume opportunities.

Programmable Motion Control products integrate 1.8° 2-phase stepper motor linear actuator, fully programmable motion controller and drive electronics. An optional encoder can deliver stall detection, position maintenance and find index mark. Products include up to 8 I/O lines.

MDrive product's precision rolled lead screws are manufactured from premium grade stainless steel with optional Teflon® coating. Designed specifically for motion control applications, our high quality screws deliver long life and quiet operation.

Simplify machine design and reduce assembly time by replacing multiple components with a single compact integrated motor. Fewer individual system components eliminates multiple potential failure points, and lowers risk of electrical noise by eliminating cabling between motor and drive.

FEATURES AND BENEFITS

- Compact integrated microstepping drive, programmable motion controller and NEMA 23 1.8° 2-phase stepper motor
- Non-captive and external shaft style available
- Advanced current control for exceptional performance and smoothness
- Single supply: +12 to +75 VDC
- 20 microstep resolutions up to 51,200 steps per rev, including: Degrees, Metric, & Arc Minutes
- Auxiliary logic power supply input
- IP20 protection rating
- 0 to 5 MHz step clock rate selectable in 0.59 Hz increments
- Up to eight I/O lines and one 10-bit selectable analog input
- Programmable motor run/hold current
- Available options include:
 - Encoder
 - Multiple motor stack lengths
 - Connector options
 - Long life linear actuators
 - Rear control knob for manual positioning
- Single motor stack length
- Lead screw lengths from 3.0" to 24.0" (77.5 to 610.0 mm) available in 0.1" (2.5mm) increments
- Lead screws with optional Teflon coating and threaded or smooth ends available
- Graphical user interface provided for quick and easy parameter setup



Additional setup, quick reference information, and supporting documents are available for download from the Novanta IMS download website <https://novantaims.com/dloads/>

Three-dimensional depictions of this product are available for download from <https://novantaims.com/dloads/3d-product-models/>



To select from the available features and build the LMD integrated stepper motor to fit your needs, use the Novanta IMS part number builder, available online at <https://novantaims.com/resources/part-number-builders/>

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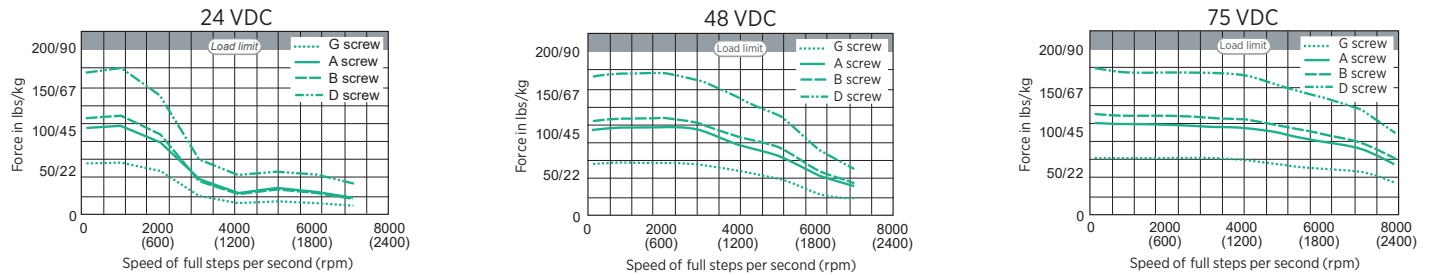
Motor Performance

		MDrive 23	
Motor		Stack length	Single
Holding torque		oz-in	90
		N-cm	64
Rotor inertia		oz-in-sec ²	0.0025
		kg-cm ²	0.18
Weight without screw		oz	22.0
		g	625.0
Maximum screw misalignment		"	±1
Maximum thrust ¹	Non-captive shaft	lbs	200
		kg	91
	External shaft with general purpose nut	lbs	60
		kg	27
Maximum repeatability	External shaft with anti-backlash nut	lbs	25
		kg	11
	General purpose	inch	0.005
	Anti-backlash ²	mm	0.127
		inch	0.0005
		mm	0.0127

¹ Performance data for maximum force/load is based on a static load and will vary with a dynamic load.

² Only applicable for External shaft linear actuator with anti-backlash nut.

Motor Speed Force



Test conditions: maximum force/load is based on a static load. This will vary with a dynamic load.

Load limits:
 non-captive shaft — 50lbs/22kg
 external shaft — determined by selected nut

Screws¹

Screw lengths ²	minimum	inches	3.0		
		mm	77.5		
	maximum	inches	24.0		
		mm	610.0		
Load Limits ³	non-captive shaft	lbs	200		
		kg	91		
	external shaft w/ general purpose nut	lbs	60		
		kg	27		
	external shaft w/ anti-backlash nut	lbs	25		
		kg	11		
End Options	threaded	metric	M6 x 1.0 mm thread to within 0.03" / 0.76 mm of shoulder		
		UNC	1/4-20 UNC-2A thread to within 0.05" / 1.3 mm of shoulder		
	smooth	inches	Ø 0.2362 ±0.001		
		mm	Ø 6 ±0.003		
Lead/Pitch	none	—	—		
	screw G	Travel	Per Rev		
			Per Full Step		
		inches	0.375	0.001875	
		mm	9.525	0.0476	
	screw A		inches	0.20	0.001
			mm	5.08	0.0254
	screw B		inches	0.167	0.000835
		mm	4.233	0.0212	
screw D		inches	0.083	0.0004165	
		mm	2.116	0.0106	

¹ Stainless steel rolled screws are corrosion resistant and non-magnetic, with Teflon coating available.

² Standard 0.1" / 2.5mm screw length increments are available.

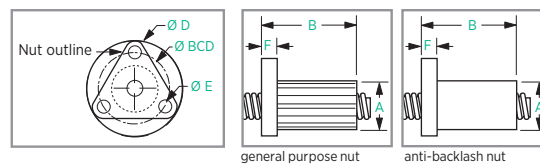
³ Performance data for maximum force/load is based on a static load and will vary with a dynamic load

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Nuts¹

			General Purpose Nuts	Anti-backlash Nuts
Dimensions	A	inches mm	0.71 18.0	0.82 20.8
	B	inches (max) mm (max)	1.5 38.1	1.875 47.63
	D	inches mm	1.5 38.1	1.5 38.1
	E	inches mm	0.20 5.08	0.20 5.08
	F	inches mm	0.20 5.08	0.20 5.08
	BCD	inches mm	1.125 28.6	1.125 28.6
	Load limit	lbs kg	60 27	25 11
Drag torque		free wheeling	1-to-3	

¹ External shaft MDrive Linear Actuators employ a nut which moves axially along the threaded shaft as the screw rotates. Two nut styles are available: general purpose and anti-backlash. While anti-backlash nuts provide higher accuracy and low drag torque, general purpose nuts are rated for higher load limits.



Accessories

Description	Length feet (m)	Part Number
Communication Converters		
Electrically isolated, in-line converter pre-wired with mating connector to conveniently set/program communication parameters for a single MDrive Plus via a PC's USB port.		
Mates to 10-pin non-locking IDC connector	12.0 (3.6)	MD-CC400-001
Mates to 10-pin friction lock wire crimp connector	12.0 (3.6)	MD-CC402-001
Prototype Development Cables		
Speed test/development with pre-wired mating connector with other cable end open.		
Mates to 10-pin locking wire crimp connector for I/O and remote encoder option	10.0 (3.0)	PD10-1434-FL3
Mates to 14-pin locking wire crimp connector for I/O and remote encoder option	10.0 (3.0)	PD14-2334-FL3
Mates to 2-pin locking wire crimp connector for power	10.0 (3.0)	PD02-2300-FL3
Mating Connector Kit		
Connectors for the assembly of cables. (Cable material not included). Sold in lots of 5. Manufacturer's crimp tool recommended for crimp connectors		
10-pin friction lock wire crimp connector for communication	—	CK-02
10-pin non-locking IDC connector for communication	—	CK-01
14-pin locking wire crimp connector for I/O and remote encoder option	—	CK-09
2-pin locking wire crimp connector for power	—	CK-04
Drive Protection Module		
Limits surge current and voltage to a safe level when DC input power to the MDrive Plus is switched on and off		
For all MLI•23 programmable motion control products	—	DPM75
Quick Start Kit		
For rapid design verification, all-inclusive QuickStart Kits includes prototype development cables and communication converter for MDrivePlus initial functional setup and system testing.		
For all MLI•23 programmable motion control products, add a "K" to the beginning of the part number when ordering		